

REMARKS

In accordance with the foregoing, claims 1, 14, 15 and 17 are amended. No new matter is added. Claims 1, 3, 6-9, and 12-20 are pending and under consideration.

CLAIM REJECTIONS UNDER 35 USC 103

Claims 1, 3, 9, 12-17 are rejected under 35 USC 103(a) as being unpatentable over the non-patent publication "All-optical fiber signal processing and regeneration for soliton communications", Bigo 10/97 (hereinafter "Bigo") with reference to U.S. Patent No. 5,323,260 Alfano et al. ("Alfano"), the non-patent publication "Optical Networks: A Practical Perspective" by Ramaswami et al. ("Ramaswami"), the non-patent publication "All-optical clock recovery using a mode-locked laser" by Smith et al. ("Smith"), and the non-patent publication "All optical clock recovery at bit rates up to 40 Gbit/s" by Ellis et al. ("Ellis").

Claim 1 is amended herewith to recite "performs amplitude modulation of said continuous wave by four-wave mixing between the signal light and the continuous wave generated by the laser oscillation using said signal light as pump light, thereby generating amplitude modulated CW light having said wavelength λ_c and including a component of said frequency f_s ." Since the four-wave mixing is performed between the signal light and the continuous wave, the amplitude modulated CW light has a larger power than an optical power of light having a different wavelength from two lights generated by the four-wave mixing of the two lights.

Alfano discloses degenerate four-wave mixing (DFWM) which results in amplification of probe pulses (see col. 4, line 67 to col. 5, line 17). Therefore, Applicant believes to be impossible to replace a SOA in FIG. 9 of Bigo with DFWM of Alfano to achieve the optical device of claim 1. Therefore, Applicant respectfully submits that claim 1 is not rendered obvious by Bigo and Alfano.

In page 72, second paragraph, Ramaswami discloses four wave mixing, but it fails to disclose a four wave mixing between two light pulses and generating amplitude modulated CW light having the same wavelength as a wavelength of one of the two light pulses. Therefore, Applicant believes that the SOA in FIG. 9 of Bigo cannot be replaced with FWM of Ramaswami to achieve the optical device of claim 1. Therefore, Applicant respectfully submits that claim 1 is not rendered obvious by Bigo and Ramaswami.

Smith and Ellis do not correct or compensate for the above-identified failure of Bigo in combination with Alfano or Ramaswami to teach or suggest all the features of claim 1.

Therefore, Applicant respectfully submits that claim 1 patentably distinguishes over the cited prior art.

Claims 3, 6-9, 12, 13 and 18-20 are also patentable at least by inheriting patentable features from independent claim 1.

Independent claim 14 is amended herewith to recite that “amplitude modulation of said continuous wave [is performed] by four-wave mixing between the signal light and the continuous wave generated by the laser oscillation using said signal light as pump light, thereby generating amplitude modulated CW light having said wavelength λ_c and including a component of said frequency f_s .” As discussed above, the cited prior art fails to render obvious this feature, and, therefore claim 14 is patentable.

Independent claim 15 is amended herewith to recite that “amplitude modulation of said continuous wave by four-wave mixing between the signal light and the continuous wave generated by the laser oscillation using said signal light as pump light, thereby generating amplitude modulated CW light having said wavelength λ_c and including a component of said frequency f_s .” As discussed above, the cited prior art fails to render obvious this feature, and, therefore claim 15 and claim 16 depending from claim 15, are patentable.

Independent claim 17 is amended herewith to recite that “amplitude modulation of said continuous wave by said signal light by four-wave mixing between the signal light and the continuous wave generated by the laser oscillation using said signal light as pump light is performed in said nonlinear optical medium, thereby amplitude modulated CW light having said wavelength λ_c and including a component of said frequency f_s is generated.” As discussed above, the cited prior art fails to render obvious this feature, and, therefore claim 17 is patentable.

Claims 6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bigo as applied to claim 1, with further reference to *All-optical FM mode-locking of fiber laser* to Greer et al. (“Greer”). Claims 7 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bigo as applied to claim 1, in further view of U.S. Patent No. 5,548,433 to Smith (“Smith”). Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bigo, in view of Smith and further in view of WO98/08138 which precedes U.S. Patent No. 6,307,984 to Watanabe (“Watanabe”).

Greer, Smith, and Watanabe, alone or in combination with Bigo, Alfano, and Ramawami, do not render obvious independent claims 1, 14, 15, and 17, and therefore, all the claims patentably distinguish over the cited prior art.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

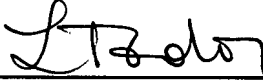
Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

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By: 
Luminita A. Todor
Registration No. 57,639

1201 New York Avenue, NW, 7th Floor
Washington, D.C. 20005
Telephone: (202) 434-1500
Facsimile: (202) 434-1501